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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/596,674

06/21/2006

Wenyuan Xu

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03/25/2009

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EXAMINER

FAYYAZ, NASHMIYA SAQIB

ART UNIT

PAPER NUMBER

2856

NOTIFICATION DATE

DELIVERY MODE

03/25/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/596,674	Applicant(s) XU ET AL.	
	Examiner Nashmiya S. Fayyaz	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 6-8, 17-19 and 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-15, 20-26 and 31-34 is/are rejected.
- 7) ☒ Claim(s) 5, 16 and 27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/4/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of species I in the reply filed on 12/19/08 is acknowledged. The traversal is on the ground(s) that a search for species I would require a search for groups 2-4. This is not found persuasive because these claims are patentably distinct and the search required for each group is different.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 6-8, 17-19 and 28-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 12/19/08.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 1-4, 9, 12-15, 20-26, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al- US Patent # 4,730,494. As to claim 1, Ishikawa et al disclose a method for examining a surface of a sample by means of ultrasound including employing a surface acoustic wave sensor (film 2, electrodes 3 and receiver 10) to measure phase frequency response (propagation velocity of the surface wave) and determining frequency dependence, see figs. 1-3 and Abstract. It is noted that Ishikawa et al do not specifically recited "estimating a time delay". However, one of ordinary skill in the art at the time of the invention would have recognized the relationship between time delay and frequency as old and well-known. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have indicated estimating the time delay of the wave propagation as a well-known alternative to the determination of frequency dependence since frequency and time are known to have an inverse relationship. As to claims 2-4, 12-15 and 24-26, Ishikawa et al disclose that determination of the frequency dependence includes determination of frequencies corresponding to the inflection points in the curves, note col. 4, lines 18 et seq and fig. 3. As to claims 9, 20 and 31, note

that the velocity equals distance over time relationship is old and very well-known to one of ordinary skill in the art of ultrasonics. Further, determining the length based on the actual surface acoustic wave transducer set-up being used is considered to have been a clear matter of design choice obvious to one of ordinary skill in the art at the time of the invention. As to claim 12, note claim 1 rejection above and further note the description of the controller 12 which controls the entire system suggesting the usage of a computer which would store the instructions of operation and calculations. As to claim 23 and 32, note discussion and sensor as described above for claim 1, analyzer (receiver 10) and processor (memory 15 and controller 12), see fig. 1.

6. Claims 1, 9, 11, 12, 20, 22, 31, 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haworth-US Patent # 5,012,668. As to claims 1, 9, 12, 20, 23 and 31-32, Haworth discloses an inclined electrode surface acoustic wave substance sensor including an associated method that includes applying a chemical substance to the SAW sensor 102 and measuring the change is "phase, delay and amplitude" for comparison to a reference SAW sensor 104 where the output signals are compared to determine differences in phase or delay, see Abstract. It is not specifically recited that the time delay associated with the propagation is based on the phase frequency response. However, it is old and well-known that the phase and delay relate to the time delay in the art of acoustics. Therefore, it would have been obvious to one of

ordinary skill in the art at the time of the invention to have recognized the relationship between phase and delay and determined the time delay from such a known relationship. As to claim 9, note the inter-digitated transducers (interlaced fingers 112,114,120 and 122). As to claim 12, note discussion above with regard to claim 1 and further note microprocessor 168 for controlling the whole process. As to claims 11, 22, and 34, usage of Love mode acoustic sensor is suggested by the usage of the interdigitated transducers 102 and 104.

7. Claims 10, 21, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haworth as applied to claims 1, 9, 11, 12, 20, 22, 31,32 and 34 above, and further in view of JP-325134 (Nakanishi et al). As to claims 10, 21 and 33, Haworth fail to teach measuring concentration specifically. However, in a closely related prior art device, Nakanishi et al disclose biological component inspection using interdigitated SAW sensor 15 and measuring the propagation speed to determine the concentration of the liquid sample, see Abstract translation. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the Nakanishi et al teaching for using the SAW sensor propagation speed measurement to also determine concentration of the chemicals in the Haworth device in order to detect the substance on the sensor along with the concentration for a more detailed assessment of the chemical substance.

Allowable Subject Matter

8. Claims 5, 16, and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nashmiya S. Fayyaz whose telephone number is 571-272-2192. The examiner can normally be reached on Tuesdays and Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. S. F./
Examiner, Art Unit 2856
/Hezron Williams/
Supervisory Patent Examiner, Art Unit 2856